

**Work Order ID 67078**

Monday, March 07, 2011 2:58:54 PM

Page 1

Item ID: D205-634-041G

Accept

Setup Start

Revision ID:

Item Name: Replacement Skidtube, Grey

Stop

Start Date: 3/8/2011 Start Qty: 1.00

Required Date: 3/18/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan: *mf*Date: *11-03-07*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr

Revision Nbr

D2580-041

D- DEO

0.00

100



DC

Document Control

DOCUMENT CONTROL

Memo

0.00

Photocopy D205-634 bluefile &amp; type labels per PPP D205-634-041 CHG003

*Swobis**HJ for BG 11-3-18*

0.00

110



CNC Bend 1

CNC Delta 100 Bender

BENDING MACHINE - SKIDTUBES

Memo

0.00

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

*> [Signature] 11-3-8*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries

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Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

120

0.00



Skidtubes

Memo

0.00

1- Deburr ends and remove bending marks

2- Prepare tube for swaging as per QSI 002

130



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

&gt; DP

11-3-8

BE 11/03/08

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Run Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

140



Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI004

A/R Aluminum Rod

2-Grind welds on step as per Dwg D2580

3-Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2 x 17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Debur

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

150



QC

Quality Control

QC10- Inspect visual per QSI004- ground welds

0.00

Memo

0.00

11/05/07

BE 11/03/08

DP 11-3-9

BE 11/03/09

Pto ->

BB

11/03/10

S 11/03/17

Y

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D205-634-041 G PAR #: \_\_\_\_\_ Fault Category: Eng - design NCR: Yes No DQA: ✓ Date: 11/03/28  
 Resolution: rework Disposition: rework QA: N/C Closed: ✓ Date: 11/03/28

NCR: 67078		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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11/03/16	#140	Found at inspection that the cross bolt spacers have cracks in them some larger some small Re Process (Swagging)	CP 11.03.16 PS/042	→ Drill out & remove cracks & bolt spacers. h/w From AFT 6-7-8-10-12-14 Replace w/ 0.049 wall D4202-1 B67308	DP 11-3-15 BE 11-03-15	S 11/03/17	OP 11.03.16 PS/042	S 11/03/16
		R.C. Design. x-bolt wall too thick. for Swagging.						

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Page 4

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Run Start



Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

160

QC5- Inspect part completeness to step on W/O

0.00

*Sulob 117*



QC

Memo

0.00



Quality Control

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

*1 BR 11-3-17*

180

Grey Sandtex(Ref:4.3.5.6) per QSI005 4.3

0.00



Powdercoat

*M 115128*

Memo

0.00

Powder Coating

START TIME:  
OVEN TEMPERATURE:  
FINISH TIME:

*11:25  
350  
11:55*

*1 BR 11-3-17*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
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Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

190

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

1 d 3h 11/03/12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 6

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of

Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ 11/16040

Sikaflex expire date: 1/108

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ 11/16040

Sikaflex expire date: 1/108

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: 11/16402

1 0 2 11/03/17

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 7

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00

S u / 03 / 18



QC

Memo

0.00

Quality Control

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for  
Foreign objects per QSI 024

220

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPPD205-634-041  
Location: \_\_\_\_\_  
PPP Rev: \_\_\_\_\_

11/3/18

230

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/3/18

POSITIVE RECALL

EFFECTIVE GP AUTH 11.03.16  
RELEASED GP DATE 11.03.17ME  
11-03-18

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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# Picklist Print

Monday, March 07, 2011 2:58:45 PM

Page 1

Work Order ID: 67078

Parent Item: D205-634-041G

Parent Item Name: Replacement Skidtube, Grey

Start Date: 3/8/2011


Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00


Comments: IPP Rev:A 11.03.07 new issue DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D4202-1  Spacer		Manufactured	No			140	Each	240.0000	20	20			
--	--	--------------	----	--	--	-----	------	----------	----	----	--	--	--


Location	Loc Qty	Loc Code
----------	---------	----------

LG	240	
65529	26	
66121	214	

D2580-1  205 Skidtube bent detail		Manufactured	No			110	Each	11.0000	1	1			
--	--	--------------	----	--	--	-----	------	---------	---	---	--	--	--

Location	Loc Qty	Loc Code
----------	---------	----------

LG	11	
59856	1	
65509	5	
65510	4	
65511	1	

D2576-3  Step (maching detail)		Manufactured	No			140	Each	40.0000	1	1			
---	--	--------------	----	--	--	-----	------	---------	---	---	--	--	--

Location	Loc Qty	Loc Code
----------	---------	----------

LG	40	
52215	40	

B-B 11/03/07

20

① 11-3-8

B-E 11/03/08

W/O:		WORK ORDER CHANGES					
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Start Date: 3/8/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D2855

Manufactured No

200

Each

85.0000

1

1



Cap



Handwritten: 11/03/17

Location

Loc Qty

Loc Code

FP6

1

1367373

Handwritten: x1

56613

1

fp7

12

65519

12

ST024

72

50513

1

50770

28

51539

2

53791

6

65569

35

AN3-5A

Purchased

No

200

Each

699.0000

2

2



Bolt



Handwritten: 11/03/17

Location

Loc Qty

Loc Code

ST350

699

115016

33

115371

500

116632

166

Handwritten: x2

AN960JD10L

NAS1149D0332J

Purchased

No

200

Each

4.0000

2

2



Washer



Handwritten: 11/03/17

Location

Loc Qty

Loc Code

ST335

4

M117010

Handwritten: x2

11912

4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

**Part No:** \_\_\_\_\_ **PAR #:** \_\_\_\_\_ **Fault Category:** \_\_\_\_\_ **NCR: Yes No** **DQA:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
**Resolution:** \_\_\_\_\_ **Disposition:** \_\_\_\_\_ **QA: N/C Closed:** \_\_\_\_\_ **Date:** \_\_\_\_\_

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Start Date: 3/8/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

ALS7-1032-130

Purchased

No

200

Each

1,570.000

50

50



HL 11/03/17

Insert

## Location

## Loc Qty

## Loc Code

FP

21

M116864

x50

115079

21

ST282

1549

111529

32

113238

17

115502

500

116800

1000

AN3C4A

Purchased

No

200

Each

2,361.000

50

50



HL 11/03/17

BOLT

## Location

## Loc Qty

## Loc Code

ST350

2361

115300

25

116075

337

116704

314

116924

1200

117010

485

x50

AN960C10L

NAS1149C0332

Purchased

No

200

Each

61.0000

50

50

R



HL 11/03/17

washer

## Location

## Loc Qty

## Loc Code

ST245

61

M116804

y50

107534

59

108246

2

W/O:		WORK ORDER CHANGES					
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Start Date: 3/8/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-13

Manufactured No

200

Each

58.0000

1

1



Handwritten: 11/03/17

Gasket

Location

Loc Qty

Loc Code

FP011

36

66550

36

FP014

22

64070

5

66137

17

D3566-5

Manufactured No

200

Each

37.0000

1

1



Handwritten: 11/03/17

Gasket

Location

Loc Qty

Loc Code

FP015

37

63574

1

65528

13

66146

3

66552

20

D3566-1

Manufactured No

200

Each

56.0000

2

2



Handwritten: 11/03/17

Gasket

Location

Loc Qty

Loc Code

FP

20

66548

20

FP011

19

65525

19

FP015

17

57715

1

66040

15

66129

1

Handwritten: XZ

Monday, March 07, 2011 2:58:45 PM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
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Start Qty: 1.00


Required Qty: 1.00

D3564-11      Manufactured      No      200      Each      16.0000      1      1  
            yl 11/03/17  
Wearshoe

Location	Loc Qty	Loc Code
FP019	16	
65159	2	
<u>66554</u>	14	<u>yl</u>

D3564-13      Manufactured      No      200      Each      45.0000      1      1  
            yl 11/03/17  
Wearshoe

Location	Loc Qty	Loc Code
FP16	22	
65522	4	
<u>66549</u>	18	<u>yl</u>
FP17	23	
59660	1	
66136	22	

D3564-9      Manufactured      No      200      Each      17.0000      1      1  
            yl 11/03/17  
Wearshoe

Location	Loc Qty	Loc Code
FP	1	
55334	1	
FP019	15	<u>B65524</u>
66153	15	<u>yl</u>
FP19	1	
62238	1	

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



# Picklist Print

Monday, March 07, 2011 2:58:46 PM

Page 6

Work Order ID: 67078

Parent Item: D205-634-041G

Parent Item Name: Replacement Skidtube, Grey

Start Date: 3/8/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-5

Manufactured No

200 Each

41.0000

1

1



Wearshoe



21 4/03/17

## Location

## Loc Qty

## Loc Code

FG

1

34806

1

FP19

24

57525

1

58709

1

66551

22

FP-19

16

63575

1

66148

15

21

D2594-3

Manufactured No

200 Each

919.0000

16

16



O-Ring, 205 Skidtube



20 4/03/17

## Location

## Loc Qty

## Loc Code

FP

543

55546

19

58191

12

59358

12

65518

500

fpa

376

61762

376

216

Monday, March 07, 2011 2:58:46 PM

Shop Packet Print

Page 6

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

Monday, March 07, 2011 2:58:46 PM

Page 7

Work Order ID: 67078

Parent Item: D205-634-041G

Parent Item Name: Replacement Skidtube, Grey

Start Date: 3/8/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D2594-1

Manufactured No

200 Each

648.0000 16 16



Plug, 205 Skidtube



JA 4/03/17

Location

Loc Qty

Loc Code

FP

483

B67379

X16

42807

112

55002

71

66122

300

FP14

165

58434

15

65512

85

65980

65

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: \*Date & initial all entries

**DART**

DESIGN #	DRAWN BY RH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

**RELEASED**  
07.06.28 #**DEO ATTACHED**

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
SEE NOTES ON  
PAGE 2 FOR D2580-041 AND  
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

#67078

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

220298

Diagram illustrating the grinding locations on a propeller cross-section:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576

RELEASED  
07-06-28

DEO ATTACHED

Technical drawing of a circular base plate with a central hole and a rectangular cutout. The drawing includes dimension lines and labels for various components and materials:

- #0.208**: Dimension for the central hole.
- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)**: Instruction for drilling two additional holes.
- SEAL WITH SIKAFLEX-241/-291**: Material specification for the seal.
- AN3-5A BOLT (1)**: Specification for the bolt used in the central hole.
- AN960JDTOL WASHER (1)**: Specification for the washer used in the central hole.
- (2 PLACES)**: Indication for the two additional drilling locations.
- D2855 CAP**: Component name for the cap being installed.
- 0.40**: Dimension for the thickness of the plate.

5

D2579 SPACER

D2596 WEB (REF)

AL57-1032-130 (REF)  
(TYP 50 PLACES)

AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C-BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

[illegible]

0.5 1.5 1.5 0 0

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

WELD AS PER DETAIL B

REFER TO DETAIL C



D3566-1 D3566-5 D3566-1 D3566-13

D3564-11 D3564-5 D3564-9 D3564-13


AN3C4A BOLT (1)  
AN360C10L WASHER (1)  
(50 PLACES)

DESIGN	DRAWN BY
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DESIGN	
CHECKED	
DATE	07.02.27

DRAWN BY	PH
APPROVED	H

 <b>DART AEROSPACE LTD.</b> WARKESBURY, ONTARIO, CANADA	
DRAWING NO.	REV. D
D2580	SHEET 2 OF 3
TITLE	SCALE
205 SKIDTUBE ASSEMBLY	1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



DEO ATTACHED

Technical drawing of a circular component, likely a cap or seal, showing various parts and dimensions. The drawing includes the following labels and dimensions:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)**: Points to two small circular holes on the left side of the component.
- AN3-5A BOLT (1)**: Points to a bolt on the left side.
- AN96QJDIOL WASHER (1)**: Points to a washer on the left side.
- D2855 CAP**: Points to the main circular component.
- SEAL WITH SIKAFLEX-241/-291**: Points to the outer edge of the component.
- SEE NOTE ii)**: Points to a specific area on the right side.
- 0.40**: Dimension line indicating a width or thickness.
- Ø0.208**: Dimension line indicating a diameter.

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

37.50  
DISTANCE TO AFT END  
OF D2596 WEB  
3 7  
REFER TO DETAIL A  
1.750 1.750  
8.750 17.375 26.000 34.188 57.313 (REF)  
7 EQUAL SPACES  
8.188 PITCH  
91.500 190.0  
(D2500-1)  
#0.508 (TYP.)  
(40 PLACES)  
REFER TO DETAIL E

WELD AS PER DETAIL F

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

NO C'BORE NO PLUG

NO C'BORE NO PLUG

NO C'BORE NO PLUG

8

H

P P P P P P P P

D3566-1 D3566-5 D3566-1 D3566-13

D3564-11 D3564-5 D3564-9 D3564-13

REFER TO DETAIL G

0.5 1.5 1.5 1.5 1.5

AN3C4A BOLT (1)  
AN960C10L WASHER (1)  
(50 PLACES)

	DESIGN	DRAWN BY	
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DESIGN <i>PH</i>	DRAWN BY <i>PH</i>
CHECKED <i>H</i>	APPROVED <i>H</i>
DATE 07.02.27	

DRAWING NO.  
D2580

REV. D  
SHEET 3 OF 3

TITLE	205 SKIDTUBE ASSEMBLY
-------	-----------------------

REV. D  
ET 3 OF 3  
SCALE

SCALE  
1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

DRAWING NO. D2580	TITLE 205 SKIDTUBE ASSEMBLY	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D2580-D-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>L</i>	MFG. APPR. <i>R</i>	APPROVED <i>MP</i>		DE APPR. <i>MP</i>		
DATE 10.09.22	DATE 10.11.04	DATE 10.11.04	DATE 10/11/04		DATE 10.11.04		

**PURPOSE:**

CHANGE ALL WELDED CROSSBOLT SPACERS TO SWAGED SPACERS

**CHANGE:**

PARTS LIST IS AMENDED AS FOLLOWS:

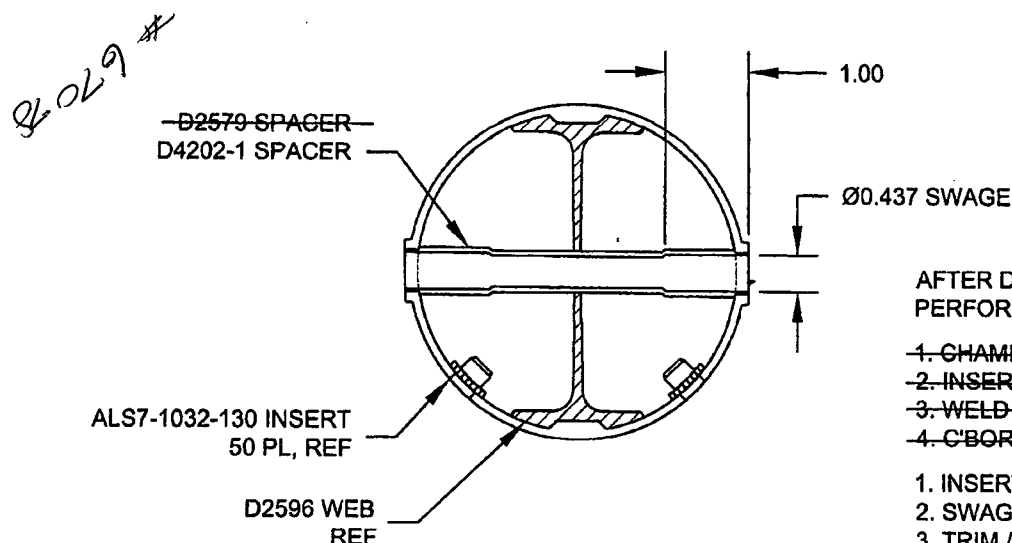
WAS

QTY	QTY	PART NUMBER	DESCRIPTION
-041	-045		
20	24	D2579	CROSS BOLT SPACER

IS

20	24	D4202-1	SPACER
----	----	---------	--------

SECTION D-D & SECTION H-H ARE AMENDED AS FOLLOWS:



**RELEASED**  
2010-11-18

AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C-BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

1. INSERT D4202-1 SPACER, 20 PL (-041) OR 24 PL (-045)
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
3. TRIM / GRIND FLUSH PER QSI 002

**SECTION D-D**  
NOT TO SCALE

**SECTION H-H**  
NOT TO SCALE

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

## Chris Provencal

---

**From:** David Shepherd <dshepherd@dartaero.com>  
**Sent:** March 16, 2011 6:21 PM  
**To:** 'Chris Provencal'  
**Cc:** 'Mike Petsche'; 'Linda Lacelle'; 'Bill Beckett'  
**Subject:** RE: 0.049 Wall Xbolt Spacers

Chris,

The substitution is acceptable. However, I would still like to see that this is repeatable. Per my earlier suggestion, I assume production is building a couple of tubes with 0.049 wall crossbolt spacers to verify that there is no cracking after several swagings???

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Wednesday, March 16, 2011 9:14 AM  
**To:** David Shepherd  
**Cc:** Mike Petsche  
**Subject:** 0.049 Wall Xbolt Spacers

David,

To approve the re-worked xbolt spacers, I'd need to attach an email from you giving OK to substitute the 0.058" wall crossbolt spacers with 0.049" wall crossbolt spacers. The crossbolt spacers are otherwise made to D4202 Rev. A.

The justification would be the initial testing, as recorded in the original design review, which showed that 0.049" wall xbolt spacers were stronger than welded/c-bored crossbolt spacers. These finding were confirmed when we tested another batch of swaged vs welded samples yesterday (March 15<sup>th</sup>, 2011).

Chris